

The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

Paper No. 19

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BOARD OF PATENT APPEALS
AND INTERFERENCES

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MAYUKI MORINAKA and TSUYOSHI OKUZONO

Appeal No. 2004-0236
Application No. 09/497,508

ON BRIEF

Before KIMLIN, OWENS and KRATZ, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-7 and 9, all the claims remaining in the present application.

Claim 1 is illustrative:

1. A polycrystalline silicon film, the polycrystalline film containing Ni atoms of which density ranges 2×10^{17} to 5×10^{19} atoms/cm³ on average, and an electrical conductivity activation energy between 0.52eV and 0.71eV, the polycrystalline silicon film comprising a plurality of needle-shaped silicon crystallites.

The examiner relies upon the following references as evidence of obviousness:

Ohtani et al. (Ohtani)	5,612,250	Mar. 18, 1997
Fonash et al. (Fonash)	5,994,164	Nov. 30, 1999

Appellants' claimed invention is directed to a polycrystalline silicon film having the recited density of nickel atoms and the specified electrical conductivity activation energy. Also, the polycrystalline film comprises a plurality of needle-shaped silicon crystallites. According to appellants, "[i]f the density of a nickel atom in the thin film deviates from the specified density indicated by the present invention, the polycrystalline silicon cannot become needle-shaped crystal particles and the electric characteristics markedly declines [sic, decline]" (page 2 of principal brief, third paragraph).

Appealed claims 1, 3, 6 and 9 stand rejected under 35 U.S.C. § 112, first paragraph, description requirement. Also, all the appealed claims stand rejected under 35 U.S.C. § 103 as being unpatentable over Ohtani in view of Fonash.

Appellants submit at page 3 of the principal brief that with respect to the § 112 rejection, "claims 1, 3, 6, and 9 stand or fall together," whereas with respect to the § 103 rejection, "claims 1-7, and 9 stand or fall together." Accordingly, all the appealed claims stand or fall together with claim 1, and we will

limit our consideration of appellants' appeal to the examiner's rejections of claim 1.

We have thoroughly reviewed the respective positions advanced by appellants and the examiner. In so doing, we concur with the examiner that the claimed subject matter is unpatentable over the cited prior art. Accordingly, we will sustain the examiner's rejection under § 103. We will not, however, sustain the examiner's rejection under 35 U.S.C. § 112, first paragraph.

We consider first the examiner's rejection under 35 U.S.C. § 112, first paragraph, description requirement. According to the examiner, the claim 1 language "needle-shaped silicon crystallites" does not have descriptive support in the original specification. As acknowledged by appellants, the phrase "needle-shaped" was substituted for the phrase "bar-like" in an amendment in response to the examiner's rejection under § 112, second paragraph. According to the examiner, Figures 11 and 12 of appellants' specification "disclose a stick-like picture," whereas "[a] needle-like shape should be pointy on one end or both ends" (page 4 of Answer, first paragraph). On the other hand, it is appellants' position that the term "needle-shaped" is not repugnant to the usual meaning that one would assign to the structures illustrated in appellants' figures. In addition,

appellants contend that "the term 'needle-shaped' has been used in the claims of several patents, including at least U.S. Patent Nos. 6,365,933, 6,194,254, 6,120,891 to describe the growth of the crystallites in a silicon film containing metal" (page 4 of principal brief, first paragraph).

In our view, appellants' original specification conveys to one of ordinary skill in the art that they had in their possession, at the time of filing the present application, the concept of a polycrystalline silicon film comprising "a plurality of needle-shaped silicon crystallites." From our perspective, specification Figure 12 reasonably conveys crystallites of needle-shaped structures, particularly when the small dimensions of the crystallites are taken into consideration. While the examiner would prefer "stick-like" terminology, we find that the language "needle-shaped" to be an appropriate substitute for the "bar-like" language criticized by the examiner. Also, appellants do not rely upon the recitation "needle-shaped" to distinguish over the applied prior art.

We now turn to the examiner's rejection of all the appealed claims under § 103 over Ohtani in view of Fonash. Appellants do not dispute that Ohtani discloses a polycrystalline silicon film comprising, like appellants, nickel atoms of a density range,

1×10^{16} to 1×10^{19} , which largely overlaps the claimed range of 2×10^{17} to 5×10^{19} . Indeed, appellants do not contend that it would not have been obvious for one of ordinary skill in the art, in light of Ohtani, to prepare a polycrystalline silicon film comprising the claimed concentration of nickel atoms. We note that appellants specifically acknowledge that "[i]n order to obtain the density ranges of Ni atoms in claims 1, 3, 6, and 9, the silicon film requires a separate process as described at column 7, lines 3-23 of Ohtani et al." (page 5 of principal brief, first paragraph). Rather, the only substantive argument advanced by appellants is that Ohtani does not disclose the claimed electrical conductivity activation energy.

Ohtani is silent regarding the electrical conductivity activation energy of polycrystalline silicon films within the referenced disclosure, although Fonash discloses a nickel-catalyzed polycrystalline film having an electrical conductivity activation energy within the claimed range. However, it is well settled that when a claimed composition reasonably appears to be substantially the same as a composition disclosed by the prior art, the burden is on the applicant to prove that the prior art composition does not necessarily or inherently possess characteristics attributed to the claimed composition. See In re Spada,

911 F.2d 705, 708, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990); In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In the present case, since the polycrystalline silicon films of Ohtani are admittedly made by the same metal induction method employed by appellants, and Ohtani discloses nickel concentrations claimed by appellants, we find it reasonable to conclude that the polycrystalline films of Ohtani also possess electrical conductivity activation energies within the claimed range. Significantly, Figures 3 and 4 of appellants' specification demonstrate that polysilicon films having nickel concentrations within the range disclosed by Ohtani possess the claimed electrical conductivity activation energies. Accordingly, we find sufficient correspondence between the polycrystalline nickel-catalyzed films of Ohtani and appellants to shift to appellants the burden of establishing that the films of Ohtani do not, in fact, possess the claimed electrical conductivity activation energy. However, no such evidence is of record. Also, although appellants make no argument that the polycrystalline film of Ohtani does not have needle-shaped silicon crystallites, we also find, by the same reasoning, that, prima facie, the film of Ohtani comprises such needle-shaped silicon crystallites. Furthermore, appellants present no explanation why the electrical conductivity activation

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energy achieved by the solid phase crystallization (SPC) process of Fonash would not also be reasonably expected to be obtained by the induction method of Ohtani.

As a final point, we note that appellants base no argument upon objective evidence of nonobviousness, such as unexpected results.

In conclusion, based on the foregoing, the examiner's rejection under § 103 is sustained whereas the rejection under § 112 reversed. Consequently, the examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

Edward C. Kimlin
EDWARD C. KIMLIN)
Administrative Patent Judge)
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)
Terry J. Owens)
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